In Case of Emergency…

Social, Behavioral, and Economic Sciences Directorate

Advisory Committee

December 14-15, 2015

Emilio Moran: Advisory Committee Chair

I. Welcome

II. Introductions of New AC Members

Lydia Villa-Komaroff
(CEOSE Liaison)
Board Member
Cytonome/ST, LLC, ATCC
Massachusetts Life Science
Center
Joined Spring 2015

John Gabrieli
Director of Athinoula A.
Martinos Imaging Center
McGovern Institute
Grover Herman Professor
Harvard-MIT

Arthur Lupia
Center for Political Studies
Hal R. Varian Professor
Department of Political
Science
Institute for Social Research
University of Michigan

Linda Smith
Distinguished Professor
Psychological and Brain
Sciences
Indiana University
(Joins in Spring 2016)

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Update on the SBE Directorate: Fay Lomax Cook

1. Welcome
2. Introduction of New Staff in Office of the Assistant Director
3. Division Updates
   - Howard Nusbaum, Division Director Behavioral Cognitive Science
   - Alan Tomkins, Acting Division Director Social and Economic Sciences
   - John Gawalt, Division Director National Center for Science and Engineering Statistics
4. 2016 Priorities and Outlook
5. Budget Update
6. Robust and Reliable Science
7. Big Awards for SBE Researchers

OAD Staff Updates

Kelli Craig-Henderson
Deputy Assistant Director

Madeline Beal
Communications Specialist

John Garneski
Budget Analyst

Cori Anderson
Program Assistant

Anne Marie Kanakkanatt
Program Analyst

BCS Updates: Howard Nusbaum, Division Director, BCS

Staff Updates:

Howard Nusbaum
Division Director

Kate Arrington
Perception, Action,
and Cognition
Program Director

Colleen Fitzgerald
Documenting Endangered
Languages
Program Director

Tamera Schneider
Social Psychology
Program Director

Charles Kalish
Science of Learning
Program Director

Stephanie Hill
Program Assistant

Kenyatta Johnson
Program Specialist

Patrick Ravanera
Operations Specialist

Raquel Robinson
Program Assistant

LaQuanda Terrell
Program Support Manager

BCS Updates Continued

- Hiring: Six Program Directors and an Associate Program Director
  - DLS, GSS, Bio Anthro, Social Psych, Linguistics, Science of Learning and Psychological Science

- Continued experience with innovative Merit Review Processes
  - GSS "Plus One", "College of Reviewers", pre-panel triage

- Broad initiatives within/across programs, divisions, and directorates
  - Forensic Science, Cyberinfrastructure and Data Intensive Science, Understanding the Brain...

BCS Updates Continued

Human Neuroscience at BCS

- Neuroscience in the wild
  - Poeppel and Ding: Recording electrical brain activity of students in classrooms to understand social interactions and neural activity in classroom learning. (INSPIRE)

- Peering into the sleeping brain
  - Norman and Paller: Decoding EEG during sleep to determine the fate of memories. (Integrative Strategies for Understanding Neural and Cognitive Systems)

- *Into the future: Mobile, real-world, multi-sensor, multi-modal, multi-person, modeling analysis+simulation*
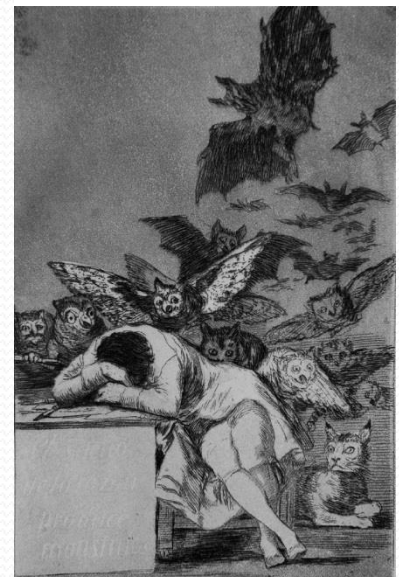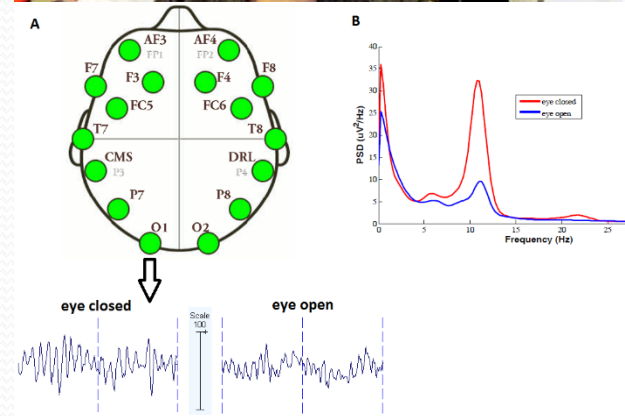
SES Updates: Alan Tomkins, Acting Division Director, SES

Staff Updates:

Wenda Bauchspies
Science, Technology
and Society

Amber Denola
Science Assistant

Seung-Hyun Hong
Economics Program
Director

Beth Rubin
Sociology Program
Director

Role changes:
- Alan Tomkins, Acting Division Director
- Katherine Meyer, Acting Deputy Division Director

SES Updates Continued

A New, Better Model to Predict International Conflict, and Beyond…

Skylar Cranmer
Awards 1357622, 1461493, and 1514750
The Ohio State University
Methodology, Measurement, and
Statistics; Political Science

- Researchers **used new methodological tools** to develop this predictive model.
- When applied historically this model is 47% better at predicting conflicts than the standard model used.
- A key finding is **trade and the strength of governmental organizations are more important variables in limiting conflict than the type of governments involved. This contradicts a commonly held theory known as democratic peace**.
- A model that predicts conflict more reliably can help governments plan ahead for global resource allocation.
- Overall advances in a modeling approach that improves power and flexibility will facilitate the analysis of many types of complex network data.
- **Tools used in 2015 to research Ebola panic and pandemic.**

SES Updates Continued

CISE and SBE Collaborating to Understand the Behavior of Hackers and Assess What's Vulnerable versus What's Not

Hsinchun Chen
SES Awards 1314631 and 1443812
   (plus CISE awards)
University of Arizona
Secure and Trustworthy Cyberspace
(SaTC)

- Researchers use novel data-mining techniques and computational cyber-analytics to understand **how hackers communicate and act online**.

- Researchers have been able to identify key cyber-crime leaders and facilitators within the large international, underground community.

- Researchers have uncovered **vulnerable devices** in the internet of things

- **REU award** allows students from underrepresented groups to study cybersecurity

SES Updates Continued

Streamlining FAFSA Increases College Access for Low-Income Students

Bridget Terry Long
Award 0721158
Harvard Graduate School of
Education
Economics

- A randomized field experiment in which low-income individuals receiving tax preparation help were also offered immediate assistance and a streamlined process to complete the Free Application for Federal Student Aid (FAFSA) for themselves or their children.

- In families that received the intervention: 36% of high school seniors had completed 2 years of college within 3 years compared to only 28% in the control group.

- Builds on evidence that forms can be a significant barrier to accessing benefit programs.

- Suggests that personal assistance could increase participation in such programs.

SES Updates Continued

Data Infrastructure Projects: National and International

- **Social Science Surveys**
  - Big Three
    - American National Election Studies (ANES)
    - General Social Study (GSS)
    - **Panel Survey of Income Dynamics (PSID)**
  - Other Significant Data Sets
    - Integrated Public Use Microdata Series (IPUMS)
    - Luxembourg Income Study (LIS)
    - School Attendance Boundary Information System (SABINS)

PSID Findings in 2015 included:

- Parenting effectiveness is more attributable to quality than quantity, with developmental outcomes including behavioral problems, emotional problems, academic performance, and, for the adolescents in the sample, risky behaviors (everything from substance abuse to staying out later than allowed by parents).

- Persistently poor kids were 13% less likely to complete high school and 43% less likely to complete college than kids who had brief spells of poverty. Persistently poor kids were also more likely to be teen parents and less likely to be consistently employed as younger (ages 25 – 30) adults.

- There are lifetime economic impacts attributable to one's first job – lower paying first job leads to lower lifetime earnings.

NCSES Updates: John Gawalt, Division Director, NCSES

Staff Updates:

Amy Burke
Science & Engineering
Indicators Analyst

Tyler Fox
Data Manager/
Statistician

Additional New Staff:

- May Aydin: Information and Technology Services Program Director
- Catherine Corlies: Publications Manager

NCSES Updates Continued

- NCSES is one of 13 Principal Statistical Agencies, with ongoing survey programs covering:
  - Education of Scientists and Engineers
  - Science and Engineering Workforce
  - Research and Development Funding and Expenditures
  - Science and Engineering Research Facilities
  - Public Attitudes Toward and Understanding of Science and Technology

- Project Highlights:
  - Survey of Doctorate Recipients: Expanded 2015 sample size (from about 42,000 individuals to over 110,000 individuals) to provide data on employment outcomes by detailed subfield, race, and gender
  - Early Career Doctorates Survey: Pilot completed, Full-scale survey under development
  - CNSTAT Workshop: Advancing Concepts and Models of Innovative Activity and STI Indicator Systems
  - Survey of Nonprofit Research and Development: Pilot survey under development

SBE's Core Programs

SBE Office of Multidisciplinary Activities (SMA)

- Science of Science and Innovation Policy
- Research Experiences for Undergraduates Sites
- SBE Postdoctoral Research Fellowships
- Science of Learning
- Interdisciplinary Behavioral and Social Science Research

Behavioral and Cognitive Sciences (BCS)

- Cognitive Neuroscience
- Perception, Action and Cognition
- Developmental and Learning Sciences
- Social Psychology
- Geography and Spatial Sciences
- Archaeology and Archaeometry
- Biological Anthropology
- Cultural Anthropology
- Linguistics
- Documenting Endangered Languages

Social and Economic Sciences (SES)

- Economics
- Political Science
- Sociology
- Law and Social Sciences
- Decision, Risk and Management Sciences
- Science of Organizations
- Science, Technology and Society
- Methodology, Measurement and Statistics

National Center for Science and Engineering Statistics (NCSES)

- Human Resources Statistics Program
- Research and Development Statistics Program
- Science and Engineering Indicators Program
- Information and Technology Services Program
- Research on the Science and Technology Enterprise: Statistics and Surveys

Priorities for 2016

Cross NSF Directorate Research Priorities

1. Understanding the Brain
2. Cyberinfrastructure for 21st Century Science, Engineering and Education
3. Secure and Trustworthy Cyberspace
4. Innovations at the Nexus of Food, Energy, and Water Systems
5. Risk and Resilience: Critical Resilient Interdependent Infrastructure Systems and Processes
6. Smart and Connected Communities
7. Inclusion across the Nation of Communities of Learners that have been Underrepresented for Diversity in Science and Engineering

Understanding the Brain

Cross-directorate activity to enable the scientific understanding of the full complexity of the brain in action and in context through targeted, cross-disciplinary investments in research, technology, and workforce development.

Explore the dynamic relationship between brain structure and activity and human cognition and behavior.

Integrative Strategies for Understanding Neural and Cognitive Systems (NCS)

- Solicitation first Issued in 2015, re-issued in 2016 (SBE, CISE, ENG, EHR)

- NSF seeks exceptional proposals that are bold, potentially risky, and truly integrative, transcending the perspectives and approaches typical of disciplinary research programs.

  - ***Neuro-engineering and Brain-Inspired Concepts and Designs***

  - ***Individuality and Variation***

  - ***Cognitive and Neural Processes in Realistic, Complex Environments***

  - ***Data-Intensive Neuroscience and Cognitive Science***

SBE has ongoing investments in cognitive science and human neuroscience through our core programs (Cognitive Neuroscience; Development and Learning Sciences; Perception, Action, and Cognition; Linguistics; Social Psychology; Science of Learning; Economics; and Decision, Risk, and Management Sciences)

Cyberinfrastructure Framework for 21st Century Science, Engineering and Education (CIF21)

## SBE Supports: Resource Implementations for Data Intensive Research in the SBE Sciences (RIDIR)

Goal: To produce large, multi-disciplinary databases *and* the tools needed to analyze these databases to address fundamental research questions in the social, behavioral, and economic sciences.
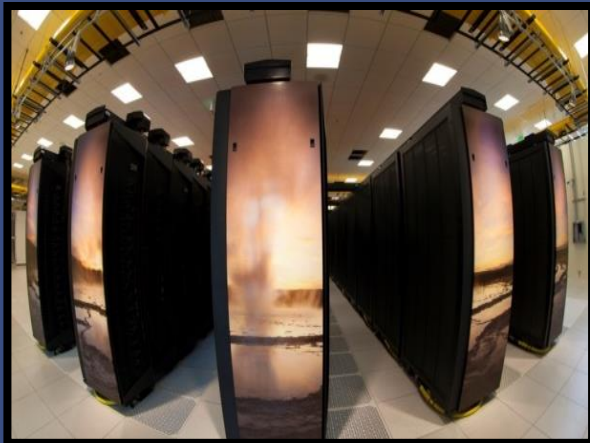
- Facilitates the study of research questions that can't be answered without large data infrastructure.

- Not only creates the resource, but also creates the tools and interface needed for discipline-based researchers to use the resource to explore research interests.

- Data infrastructure designed with community input from the outset will be more effective than the Field of Dreams Model of "If you build it, they will come."

SBE Budget Overview

- SBE FY 2016 Request is **$291.46** Million

- NSF is currently operating under a Continuing Resolution

- Uncertainty regarding SBE's budget until a final FY 2016 Appropriation is enacted

$254	$242	$257	$276	$291
2012 Actual	2013 Actual	2014 Actual	2015 Actual	2016 Request
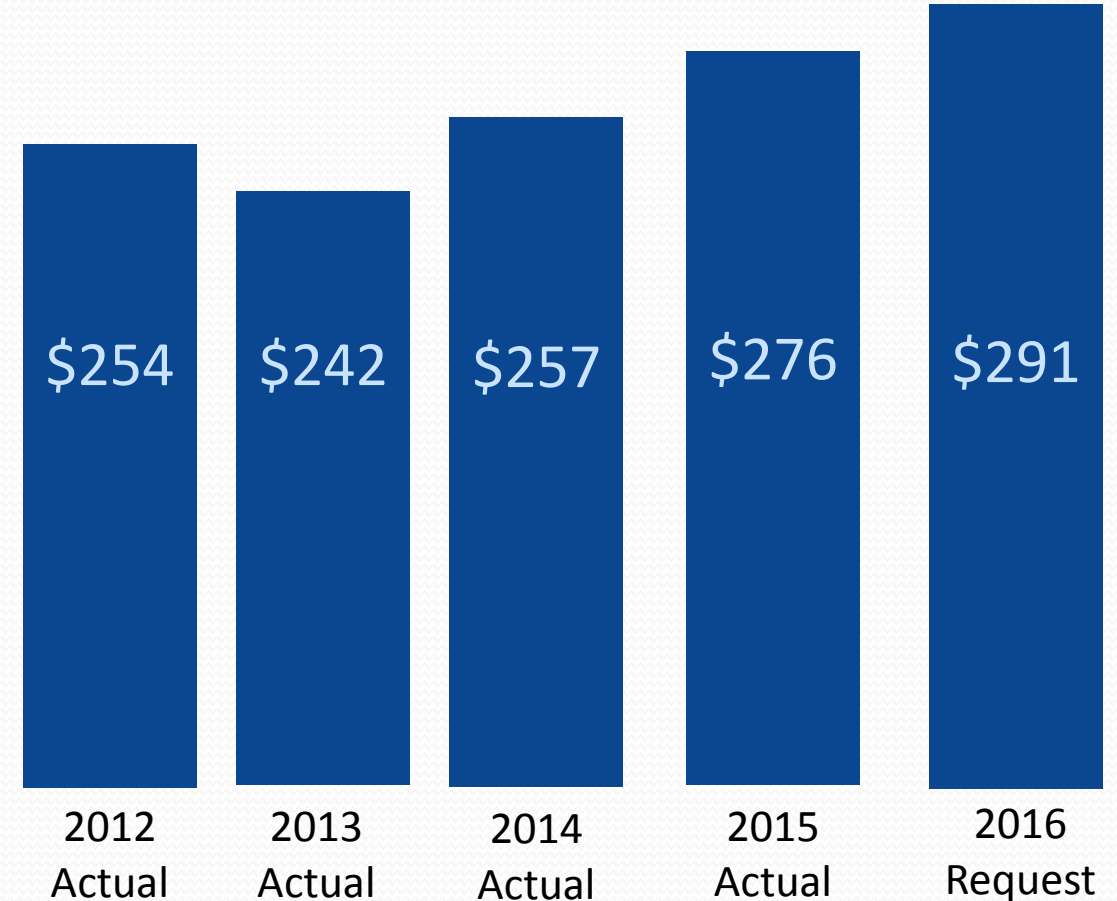
Robust and Reliable Science Director's Symposium

Goal: To raise awareness among NSF program officers and begin a discussion of what the Foundation can do to improve the reliability of the research we fund

Keynote: Dr. Marcia McNutt, Editor-in-Chief: *Science*; incoming president of the National Academies: Robust and Reliable Research

Invited Talks:
- Dr. Kenneth Bollen, University of North Carolina-Chapel Hill: SBE Perspectives on Robust and Reliable Science
- Dr. J. Tinsley Oden University of Texas-Austin: Foundations of Predictive Science: Selection and Validation Models of Complex Systems

Breakout topics and session leaders:
- Statistics (Dr. Steven Goodman, Stanford University)
- Data- and code-sharing (Dr. Victoria Stodden University of Illinois at Urbana-Champaign)
- Replication and generalization of studies (Dr. Brian Nosek, University of Virginia)

Drawing courtesy of Layne Scherer

Awards to SBE Supported Researchers

- The Golden Goose Award

- MacArthur Fellows "Genius Grants"

- The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel

Golden Goose Award: Marshmallow Test

Walter Mischel
Robert Johnston Niven
Professor of Humane Letters
Department of Psychology
Columbia University

Philip Peake
Director Center for
Community Collaboration
Professor of Psychology
Smith College

Yuichi Shoda
Professor of Psychology
University of Washington

MacArthur Fellowships "Genius Grants": 3 of 24

Matthew Desmond
John L. Loeb Associate
Professor of the Social
Sciences and co-director of
the Justice and Poverty
Project
Harvard University

Beth Stevens
Assistant Professor
Department of Neurology
Harvard Medical School

Heidi Williams
Assistant Professor
Department of Economics
MIT

The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2015

Angus Deaton
Dwight D. Eisenhower
Professor of Economics and
International Affairs
Princeton University

AC Meeting Agenda (Today)

9:45 am – 10:35 am	BCS COV Report: Dr. JW Harrington, BCS COV Chair SBE/BCS response: Dr. Howard Nusbaum, Division Director, BCS Dr. Amber Story, Deputy Division Director, BCS Advisory Committee discussion and vote on acceptance
10:35 am – 10:50 am	Break
10:50 am – 11:40 am	SMA COV report Dr. Catherine Eckel, SMA COV Chair SBE/SMA response: Dr. Deborah Olster, Senior Advisor, SBE Advisory Committee discussion and vote on acceptance
11:40 am – 12:40 pm	Robust and Reliable Science Dr. Kenneth Bollen, Chair, Subcommittee on Recommendations for SBE Robust and Reliable Research Advisory Committee discussion
12:40 pm – 1:45 pm	Lunch (on your own)
1:45 pm – 2:15 pm	Behavioral and Social Sciences Research at NIH Dr. William Riley, Director, Office of Behavioral and Social Sciences Research, NIH Discussion with Advisory Committee
2:15 pm – 3:15 pm	White House OSTP Social and Behavioral Sciences Team Dr. Maya Shankar, Senior Advisor SBST, OSTP Dr. William Congdon, Fellow, SBST, OSTP Discussion with Advisory Committee
3:15 pm – 3:30 pm	Break
3:30 pm – 4:30 pm	NSF activities and Strategies Related to Graduate Education Dr. Joan Ferrini-Mundy, Assistant Director, Directorate for Education and Human Resources Discussion with Advisory Committee
4:30 pm – 5:00 pm	Preparation for meeting with NSF leadership
5:00 pm – 6:00 pm	Reception for AC members and SBE staff (Rm 905)
6:30 pm	No-host dinner for Advisory Committee (Bangkok Bistro, 715 N. Glebe Road, Arlington, VA)

AC Meeting Agenda (Tomorrow)

9:00 am – 10:00 am	NSF Office of Legislative and Public Affairs Ms. Amanda Greenwell, Head of NSF Office of Legislative and Public Affairs Discussion with Advisory Committee
10:00 am – 11:00 am	Meeting with NSF leadership Dr. Richard Buckius, Chief Operating Officer, NSF
11:00 am – 12:00 pm	Next Steps in Transformational SBE Science Dr. Emilio Moran, SBE Advisory Committee Chair Dr. Arthur "Skip" Lupia
12:00 pm – 12:30 pm	Agenda and dates for future meetings, assignments and concluding remarks Dr. Emilio Moran, SBE Advisory Committee Chair Dr. Fay Lomax Cook, SBE Assistant Director
12:30 pm	Adjourn

Spring Meeting:
May 23-24, 2016

Thank You…